



Cairo Air Improvement Project
Lead Pollution Abatement Component

**Financial Feasibility Assessment: Small-and
Medium-sized Smelter Upgrade and
Relocation**

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Acronyms and Abbreviations

CAIP	Cairo Air Improvement Project
CIP	(US) Commodity Import Program
FINPRO	Specialized financial forecasting computer software
LSAP	Lead Smelter Action Plan
mt	Metric tons
USAID	United States Agency for International Development/Egypt Mission
£E	Egyptian pound (currency)

I. Background

Cairo Air Improvement Project Objective

Objective 1 of the Lead Smelter Action Plan (LSAP) is to achieve a major reduction in emissions from the various secondary lead smelters in the Greater Cairo Area. An assessment of the financial feasibility of relocating and upgrading the Awadallah facility, the largest smelter in Cairo (and Egypt) has been completed. Construction plans have been completed for upgrading of the General Metals facility, the second largest smelter, but the work has not yet been initiated. This report presents a similar analysis relative to the small- and medium-sized smelters presently located within the urbanized area of the Cairo region.

The analysis is based on the development and operation of a prototypical design for a small/medium smelter, prepared by Stone and Webster Engineering Corporation. This is intended to demonstrate the feasibility of this scale of smelting operations in a modern facility with improved environmental and occupational safety conditions. The new facility would be equipped with state-of-the-art air pollution control systems and a workplace environment that will virtually eliminate worker exposure to the toxic effects of lead. Relocation of the facility will involve a significant investment in plant and equipment as well as increased operational expenses associated primarily, though not entirely, with the air pollution control systems.

Conceptual planning for the upgrading and relocation of small- and medium-sized smelters is being accomplished with USAID support. Operational plans and conceptual drawings for the prototype facility have been prepared along with preliminary cost estimates. Owners of small- and medium-sized facilities choosing to implement the project may receive technical assistance in two ways:

- ♦ Financing assistance through the United States Commodity Import Program (CIP) or various other funding agencies
- ♦ Monitoring and coordination of the various project activities.

Although a considerable amount detailed planning remains to be done before cost estimates can be finalized, the existing information is sufficient to permit a preliminary assessment of financial feasibility.

The Lead Smelting Industry

The technical feasibility of modern secondary lead smelters is well established, but a question arises concerning the financial feasibility of the operation, especially for small-scale operations. In some respects, the secondary lead industry is under attack from environmentalists (see Greenpeace reference in the Bibliography) and regulators (e.g. Basel Convention restrictions on the exportation of scrap batteries). In the United States for example, the number of smelters in operation declined from 43 in 1984 to 23 in 1992 (25 closures and 5 openings). During the same period, industry capacity declined by nearly 100,000 metric tons (mt). The decrease in capacity was attributed to stagnant demand, excess capacity, and the costs of complying with environmental regulations. The industry trend during this period of restructuring was for smaller plants to close in favor of larger facilities in order to gain the economies of scale associated with large industrial operations.

In Egypt, smelter operators are under considerable pressure to reduce emissions and plant closures have not been uncommon, although to date none have been permanent. Under the best of circumstances smelter operators face an uncertain future. The need for a financial assessment of the present project proposal is, therefore, unequivocal.

2. Approach

The output of the assessment consists of financial projections based on *pro forma* income statements, balance sheets, and cash flow statements designed to illustrate the financial performance of the smelting operations under the parameters and conditions associated with the new facility. Product prices, the costs of production inputs, and other process costs are the critical elements affecting overall financial performance.

Financial Model

The forecasting approach used in this analysis employs “FINPRO,” a financial model that has been widely used for many years in the evaluation of development projects. The main outputs of the model are projections that represent the financial statements of a hypothetical small smelting operation, in new facilities after relocation to a new site. Income statements, cash flow statements, and balance sheets are produced based on input data entered on various subsidiary worksheets. Additional statements are produced which provide an overview of program financing and a summary of monitoring indicators portraying overall performance in financial terms. In total, the model includes 14 linked worksheets in a single Excel file. The model permits various sensitivity analyses to be made with relative ease, such as the impact of various program options on the rate of return on the owner’s equity.

Operational and Financial Assumptions

Input data for the financial model consists of both program-related operational information (mass balance) and financially oriented information. A summary of principal assumptions is presented below, and a more detailed description of assumptions is presented in Annex 1.

- ♦ The financial projections are presented as though an entirely new business is being established. This is necessary because of the lack of historic financial information for use in accurately portraying the financial impacts of making the transition from existing to new production facilities.
- ♦ Production of the new smelter will be 1,070 mt per year consisting entirely of soft (crude) lead ingots.
- ♦ Lead bearing feed material will consist entirely of dry lead acid batteries.
- ♦ The local supply of scrap batteries and other lead scrap will be sufficient to meet the demands of the new facility and will be somewhat less than the quantity of raw material required for production of a comparable amount at the existing facility. The assumed increase in the efficiency of lead recovery that supports this conclusion, is perhaps the most critical factor in the financial feasibility assessment.
- ♦ In the near- to medium-term (e.g. 5–10 years) there will be no major changes in demand and pricing patterns; operational cost escalation will occur at a pace somewhat below that of the general consumer price index in Egypt. Product prices will increase at a pace more closely associated with international inflation rates.
- ♦ Capital costs used in the analysis are estimates prepared by CAIP staff based on their analysis and revisions of Stone & Webster estimates, which result in a reduction of approximately 60 percent of the costs as projected by Stone & Webster. It has been assumed that this level of cost reduction can be achieved without detriment to the production capabilities, the effectiveness of emission controls and occupational safety provisions of the conceptual design. It is of particular importance that these assumptions be carefully reviewed and confirmed.
- ♦ Planning, detailed design, licensing/permitting, tendering, procurement, and construction and equipment installation will be completed in time to permit operations to begin in 2000, 2001 being the first full year of operations.
- ♦ Project financing will consist of owner's equity (about 60 percent) and a loan for the balance to be arranged under the terms of the CIP or any other financing program. The model assumes that loan terms are at normal commercial rates, except that the loan is interest free to the borrower during the first 18 months.
- ♦ The owner will cease operations at existing facilities and all personnel from those facilities will be transferred to the new smelter. Neither the costs of site remediation nor the benefits of site reuse are considered in this analysis.

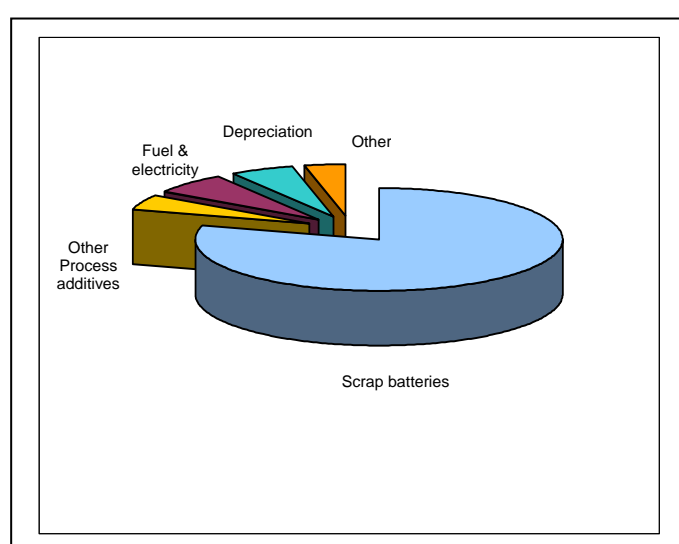
3. Preliminary Findings

Based on analysis of the preliminary capital and operating cost estimates and the assumptions outlined above and in Annex 1, relocation and upgrading of small- and medium-sized smelters appear to be financially feasible. It would, of course, be necessary to conduct feasibility assessments for such facilities on a case-by-case basis, but the analysis of a prototype facility demonstrates the expectation that positive feasibility is achievable. Highlights of findings and conclusions of this analysis are presented below:

1. Scrap Battery Costs are Dominant among Operational Expenses

Figure 1

Operating Cost Components for Small- and Mediumsized Lead Smelters



Scrap battery feedstock accounts for nearly 80 percent of all operating costs. As such, the financial performance of the operation is highly sensitive to changes in the price of this material. A 10 percent increase in scrap battery prices that cannot be passed on to consumers, for example, produces a decline in the range of 40–50 percent in the rate of return on owner's equity during the forecast period. Figure 1

shows the relative importance of the principal operational cost elements. The second most important cost item is fuel and electricity, which account for about 7 percent of total costs.

2. Efficiencies in the New Smelter Permit Absorption of Pollution Control Costs, While Retaining Profitability

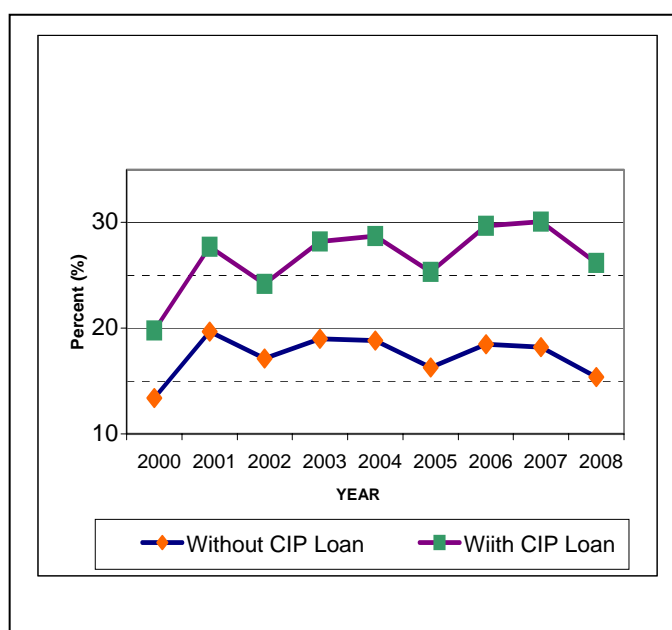
Experience elsewhere concerning the impact of air pollution control costs on the profitability of secondary lead smelting operations has been mixed. Often, however, observers have concluded that the impact is real, significant, and can result in small smelters becoming unprofitable. Based on the data available at the present time however, it appears that small- and medium-sized smelters can be operated profitably in Egypt. This can likely be attributed to more efficient recovery of lead metal from lead bearing raw materials and recovery of lead from dust trapped in the air pollution control systems and recycled. For equivalent production volumes, the new facility will save several

hundred tons of scrap battery input in comparison with the existing facility. The new facility will also recycle about 40 mt of dust collected at the baghouses, which also contributes to the improved overall efficiency of the new smelter.

3. A Financing Strategy that Includes Borrowing Results in a Higher Rate of Return on the Owner's Equity

Figure 2

Small-and Medium-sized Smelter Relocation: Return on Owner's Equity



The financial results achieved under alternative financing scenarios demonstrate that borrowing, as an element in the project financing plan, has certain advantages. As illustrated in Figure 2, the principal advantage is in the fact that the rate of return on the owner's equity is higher when the owner employs a smaller amount of his own capital in financing the project. Of course, 100 percent equity financing results in the largest aggregate accumulations of cash, after tax

incomes and equity, but primarily because of the greater infusion of personal capital at the beginning. By employing borrowed funds and reducing his own commitment of funds, the owner gains a greater rate of return on the amounts invested and retains more of his assets for other investments.

4. Financing is Needed for Working Capital as Well as for Capital Investment

It has been assumed that about 250 mt of scrap batteries, equivalent to a 2-month supply, will be maintained in inventory. Assuming the additional need to maintain an inventory (though smaller in size) for other process inputs, the total capital required to maintain the inventory for smelter operations is estimated at about £400,000. In developing the financial projections, it has been assumed that the inventory levels will be built gradually, with an initial working capital requirement of £250,000.

5. Pending Confirmation of Data Inputs, Especially the Costs of Raw Materials and Product Prices, the Proposed Smelter Relocation Appears Financially Feasible

This study of financial feasibility necessarily had to be based on a set of assumptions. Every effort has been made to be conservative (e.g. to “err on the high side”) in determining the cost information used in this analysis. Under one sensitivity test (the scenario described above wherein the scrap battery costs proved to be 10 percent higher than expected), the average rate of return declined to just under 15 percent over the forecast period, which would make the investment only marginally attractive. This assumes however, that none of the higher input costs could be passed on to customers, which in reality would not likely be the case.

4. Conclusions

The financial assessment has been finalized based on the cost assumptions for small and medium sized secondary lead smelters, which have been done in a previous report, *Technical and Economic Study for Small and Medium Lead Smelters*. A detailed summary of the assumptions used in this assessment is provided in Annex 1, in tabular form. For each assumption, an indication of any additional data requirement, analysis, or verification is provided.

The results of this assessment may be used as a plausible portrayal of the financial performance of a new small- or medium-sized smelter located at a new site. The spreadsheets comprising the financial model, as applied to the data available for this assessment, are provided for reference in Annex 2.

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Annex 1

Assumptions for the Interim Financial Assessment and Additional Data Requirements

Assumption/Data Item	Additional Input and/or Data Verification and Refinement
Inflation: Domestic inflation has been estimated at 4.5% in 1998 and is projected to decline gradually to 3.5% in the year 2003 and remain stable thereafter. International inflation is estimated at 2.0% in 1998, declining to 1.8% in 1999 and remaining stable thereafter.	Note:1
Escalation of Operational Costs: Escalation of operational costs is projected at a weighted composite rate comprised of 60% of the domestic inflation rate and 40% of the international inflation rate. No provision has been made for <i>real increases</i> in prices of various inputs.	Consider the possibility of projecting real increases (e.g. in excess of normal inflationary trends) in prices for diesel fuel and electricity.
Escalation of Product Prices: Product prices are projected in increase at a rate slightly greater (0.2%) than the international inflation rate.	Note:1
£E/US\$ Exchange Rate: Is estimated to remain constant at LE3.38/US\$1.00.	Note:1
Depreciation Rate: Estimated at 4% of depreciable items per year, based on a 7 year economic life for mobile equipment, 15 years for mechanical and electrical equipment and 40 years for civil works.	Subject to revision after the capital costs estimates have been finalized.
Cost of Replacement Fabrics for Baghouses: Has been estimated at £E13,750 each for 4 chambers or a total of £E55,000 every third year.	Should be checked.

Assumption/Data Item	Additional Input and/or Data Verification and Refinement
Construction Loan and Loan Terms: It is assumed that construction financing will include a loan of £E1.2 million, which would be about 40% of currently estimated capital costs and working capital needs. Owners are expected to be able to borrow funds under the Commodity Import Program at 11% interest, with commitment charges of 0.75% and 8 years repayment after a grace period of 18 months. The loan would be interest free to the owner during the grace period. The current assumption for debt service payments is based on equal annual payments of principal.	To be reviewed and discussed with owners after finalization of cost estimates. If desired, the model can be run under varying financing scenarios to illustrate the impact on key indicators. The basis for establishing debt service payments should be checked (e.g. annuity basis vs. equal principal payments).
Electricity, Water, and Wastewater Treatment: See Annex 2, Operating Cost Worksheet. Figure shown for electricity consumption is a rough estimate made by the financial analyst, in an amount proportional to that used in the Awadallah study. Water usage is taken from the Stone & Webster estimate. No specific information is available concerning wastewater treatment and disposal costs.	The designer & process specialists should also check these data. Data should also be provided for electricity demand charges. Cost estimates for wastewater treatment should be developed.
Maintenance and Administration & Overhead: Also from Annex 2, Operating Cost Worksheet. Maintenance is estimated based on US experience, adjusted downward for lower labor costs and the lower technological requirements of the small facilities. As shown, it is approximately 1.3% of capital costs. Costs of replacement fabrics for baghouses (noted above) are estimated separately and added to the basic maintenance cost every three years. The costs of general administration and overhead are estimated at 1% of all other operational costs. This is somewhat less than US experience, but deemed reasonable for the Egyptian environment and a small operation.	Request that the designer and process specialists review the expected levels of maintenance and make recommendations for adjustment of these figures as may be appropriate.
Disposal of Slag and Other Wastes: Refer again to Annex 2, Operating Cost Worksheet. Gross assumptions have been made concerning disposal costs for slag and other wastes at £E50 per ton. Quantities for other wastes are based on US experience.	Estimates of waste disposal costs should be confirmed.
Income Tax Rate: Estimated at 40% of net income.	Should be checked.
Accounts Receivable and Payable: There appears to be very little delay between the time of delivery of goods and receipt of payment and from the receipt of materials and payment therefor. In making projections for accounts receivable and accounts payable therefore, it was assumed receivables are equivalent to 10 days of revenue and that payables are equivalent to 3 days of expenses.	Note 1.
Inventories: Have been estimated based on an assumed level for scrap battery feed of 250 tons and assumed level for all other inputs equivalent to two months requirements.	Note 1.

Assumption/Data Item	Additional Input and/or Data Verification and Refinement
Capital Cost Estimates, Base Costs: CAIP SO3 staff estimates are based on surveys of local manufacturers' costs.	
Capital Costs, Contingencies and Taxes/Duties: The capital cost data included in the interim assessment have been adjusted using a 20% physical contingency factor and inflation factors as described above. No provision has been made for taxes and duties. Customs duties may possibly be waived on the air pollution control equipment; the applicability of other taxes and duties is unknown.	Contingency and tax issues must be resolved. Physical contingencies will be determined by the designer. Customs duties may or may not be applicable to various imported items and sales or other taxes may be applied to all or part of the costs.

Note: 1: This indicates data that is assumed to be reasonable and acceptable for use in the projections unless a better basis for the assumption can be demonstrated. All assumptions however, are open for discussion and possible revision.

Annex 2

Financial Model

FINPRO - FINANCIAL PROJECTION PROGRAM
SMALL & MEDIUM SIZED SECONDARY LEAD SMELTERS

Coke Air Improvement Project
 Small Medium, Size Lead Smelter Relocation Plan
 Financial Analysis

TABLE 1 BASIC DATA AND ASSUMPTIONS											
FIRST YEAR SHOWN IN TABLES =	1998	1999	2000	2001	Year for constant prices =		1998				
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Change in CPI (Jan.-Dec.)	4.50%	4.50%	4.00%	4.00%	4.00%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%
Change in Int'l CPI (Jan.-Dec.)	2.00%	1.80%	1.80%	1.80%	1.80%	1.80%	1.80%	1.80%	1.80%	1.80%	1.80%
Local Inflation Impact (%)	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%
International Inflation Impact (%)	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%
Exchange rate 1 US\$ =	3.38	3.38	3.38	3.38	3.38	3.38	3.38	3.38	3.38	3.38	3.38
Inflation factor for projections	1.0000	1.0346	1.0327	1.0312	1.0312	1.0297	1.0282	1.0282	1.0282	1.0282	1.0282
Cum. Inflation for projections	1.0000	1.0346	1.0684	1.1018	1.1361	1.1699	1.2029	1.2368	1.2717	1.3075	1.3444
Cum. Inflation for product pricing	1.0000	1.0200	1.0404	1.0612	1.0824	1.1041	1.1262	1.1487	1.1717	1.1951	1.2190
% of Inflation for Assets Revaluation			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
VALUES FOR THE FIRST YEAR:											
Working Capital needs Year 1 (1999)	800	Other Assets or Liab. needs year 1 (1999)					-	Note: All amounts in Thousand LE unless otherwise noted.			
Cash Year 1 (1999)	250	Retained Earnings Year 1 (1999)					-				
Deferred Expenses Year 1 (1999)	0										
% Annual Depreciation		4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
Assumed Assets enter operation	5,379	-	-	-	-	-	-	-	-	-	-
Assets enter operation checked	5,379	-	-	-	-	-	-	-	-	-	-
Work in progress	5,379	-	-	-	-	-	-	-	-	-	-
Fixed Assets (unrevalued)	-	5,379	5,379	5,379	5,379	5,379	5,379	5,379	5,379	5,379	5,379
Accumulated Depreciation	-	143	359	574	789	1,004	1,219	1,434	1,649	1,865	2,080
Assets Revaluation factor	1.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
USED: Fixed Assets		5,379	5,379	5,379	5,379	5,379	5,379	5,379	5,379	5,379	5,379
Annual Depreciation	-	143	215	215	215	215	215	215	215	215	215
Accumul. Depreciation	-	143	359	574	789	1,004	1,219	1,434	1,649	1,865	2,080
Revaluation surplus	-	-	0	-	-	-	-	-	-	-	-
Average fee base	N/A	5,307	5,128	4,912	4,697	4,482	4,267	4,052	3,837	3,622	3,407

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FINPRO - FINANCIAL PROJECTION PROGRAM
SMALL & MEDIUM SIZED SECONDARY LEAD SMELTERS

Gairo Air Improvement Project
Small Medium Size Lead Smelter Relocation Plan
Financial Analysis

TABLE 2 **OPERATIONAL EXPENSES IN CONSTANT AND CURRENT PRICES**

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
% INCREASE IN BASIC VARIABLES:										
Scrap Batteries Processed, mt		0.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total Production, mt		0.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Replacement Fabrics for Baghouses - LE 000		-	-	55	-	0	55	-	-	55
Fixed assets		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
OPERATIONAL EXPENSES:										
PERSONNEL: Current Prices up to	1998	Constant Prices Thereafter			No. Of Smelters					
No. Employees	0.00	18.0	18	18	18	18	18	18	18	18
Annual unit salary - 1998 prices	0.00	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917	3,917
Number of Employees	-	18	18	18	18	18	18	18	18	18
Unit salary, current prices	-	4,165	4,315	4,450	4,582	4,711	4,844	4,981	5,121	5,266
Option: Give Personnel Cost, in which case the above information is not needed and would not be used										
If non-zero use:	0	0	0	0	0	0	0	0	0	0
PERSONNEL COST - LE 000:	-	47	71	71	71	71	71	71	71	71
OTHER EXPENSES										
CURRENT EXPENSES UNTIL:	1998	AND % REAL INCREASE THEREAFTER:								
Scrap Battery Feedstock	-	1,030	1,545	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Process Additives (Flux, etc.)	-	60	90	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Diesel Fuel	-	54	81	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Electricity	-	34	50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Slag & Other Waste Disposal	-	7	11	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Maintenance	-	27	40	55	0.00%	0.00%	55	0.00%	0.00%	55
Admin., Overhead & Utilities	-	14	21	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CURRENT EXPENSES UNTIL	1998	- CONSTANT PRICES THEREAFTER								
Scrap Battery Feedstock	-	1,030	1,545	1545	1545	1545	1545	1545	1545	1545
Process Additives (Flux, etc.)	-	60	90	90	90	90	90	90	90	90
Diesel Fuel	-	54	81	81	81	81	81	81	81	81
Electricity	-	34	50	50	50	50	50	50	50	50
Slag & Other Waste Disposal	-	7	11	11	11	11	11	11	11	11
Maintenance	-	27	40	95	40	40	95	40	40	95
Admin., Overhead & Utilities	-	14	21	21	21	21	21	21	21	21
Income Taxes, & % Income taxes	0	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%
Taxes (current prices)	0	107	147	124	152	156	132	162	165	138
Other Expenses (Given)	-	-	-	-	-	-	-	-	-	-

**FINPRO - FINANCIAL PROJECTION PROGRAM
SMALL & MEDIUM SIZED SECONDARY LEAD SMELTERS**

*Gold Air Improvement Project
Small Medium Size Lead Smelter Relocation Plan
Financial Analysis*

TABLE 3		DEBT SERVICE ANALYSIS									
		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Gross Long Term Debt (Year 1)											
Annual Debt Revaluation Losses			0	0	0	0	0	0	0	0	0
LOANS WITH CONSTANT PRINCIPAL REPAYMENT:											
Facility Construction Loan	Loan =	1,200	Interest:	11.00%	Commitment interest:	0.75%	Up-front%	0.00%			
Loan Start Y	1999.05	Interest Capital, until year:	1999.90	Amortiz. start year:	2000.60	Years to repay =	8.5				
Disbursements		1,200									
Annual Amortization:	126	1999	Inter. Y1	95.00%	1998	%Last interest capt.	90.00%	2000	Amort. Y 1	40.00%	
Cumulative Disburs.	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	
Amortization	0	0	126	126	126	126	126	126	126	126	
Loan Balance	1200	1449	1023	897	771	644	515	362	206	139	
Commit+Gen Interest, unadjusted	71	129	119	108	92	78	64	50	36	22	
Up-Front Charge	0	0	0	0	0	0	0	0	0	0	
Total interest, adjusted	67	129	119	108	92	78	64	50	36	22	
Of which interest capitalized is	0	0	0	0	0	0	0	0	0	0	
Loan No. 2											
Loan =		0	Interest:	0.00%	Commitment interest:	0.00%	Up-front%	0.00%			
Loan Start Y	0.0	Interest Capital, until year:	0.00	Amortiz. start year:	0.00	Years to repay =	0.0				
Disbursements		0									
Annual Amortization:	0	Inter. Y1	100.00%	0	%Last interest capt.	0.00%	0	Amort. Y 1	100.00%		
Cumulative Disburs.	0	0	0	0	0	0	0	0	0	0	
Amortization	0	0	0	0	0	0	0	0	0	0	
Loan Balance	0	0	0	0	0	0	0	0	0	0	
Commit+Gen Interest, unadjusted	0	0	0	0	0	0	0	0	0	0	
Up-Front Charge	0	0	0	0	0	0	0	0	0	0	
Total interest, adjusted	0	0	0	0	0	0	0	0	0	0	
Of which interest capitalized is	0	0	0	0	0	0	0	0	0	0	
Loan No. 3											
Loan =		0	Interest:	0.00%	Commitment interest:	0.00%	Up-front%	0.00%			
Loan Start Y	0.0	Interest Capital, until year:	0.00	Amortiz. start year:	0.00	Years to repay =	0.0				
Disbursements		0									
Annual Amortization:	0	Inter. Y1	100.00%	0	%Last interest capt.	0.00%	0	Amort. Y 1	100.00%		
Cumulative Disburs.	0	0	0	0	0	0	0	0	0	0	
Amortization	0	0	0	0	0	0	0	0	0	0	
Loan Balance	0	0	0	0	0	0	0	0	0	0	
Commit+Gen Interest, unadjusted	0	0	0	0	0	0	0	0	0	0	
Up-Front Charge	0	0	0	0	0	0	0	0	0	0	
Total interest, adjusted	0	0	0	0	0	0	0	0	0	0	
Of which interest capitalized is	0	0	0	0	0	0	0	0	0	0	
Loan No. 4 (Bond Issue)											
Loan =		0	Interest:	0.00%	Commitment interest:	0.00%	Up-front%	0.00%			
Loan Start Y	0.00	Interest Capital, until year:	0.00	Amortiz. start year:	0.00	Years to repay =	0.0				
Amounts Issued		0									
Repayment	0	0	Inter. Y1	100.00%	0	%Last interest capt.	0.00%	0	Amort. Y 1	100.00%	
Amounts Issued, Cumulative											
Amounts Redeemed											
Outstanding Balance											
Commit+Gen Interest, to be adjusted											
Up-Front Charge											
Total interest, adjusted											
Of which interest capitalized is											

FINPRO - FINANCIAL PROJECTION PROGRAM
SMALL & MEDIUM SIZED SECONDARY LEAD SMELTERS

Cairo Air Improvement Project
 Small Medium Size Lead Smelter Relocation Plan
 Financial Analysis

TABLE 3 DEBT SERVICE ANALYSIS

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
LOANS WITH CONSTANT DEBT SERVICE PAYMENT:										
*Name Loan 5	Loan=	0	Interest=	0.00%	Commitment interest	0.00%	Up-front%	0.00%		
Loan Start Y	0.00	Interest Capital until year	0.00	Amortiz.start year	0.00	Years to repay *	0.00			
Disbursements	0	0	0	0	0	0	0	0	0	0
Repayment:	0	0	Inter. Y1	100.00%	%Last interest capit.	0.00%	Amort. Y 1	100.00%		
Cumulative Disburs.	0	0	0	0	0	0	0	0	0	0
Amortization	0	0	0	0	0	0	0	0	0	0
Loan Balance	0	0	0	0	0	0	0	0	0	0
Commit+Gen.Interest, to be adjusted	0	0	0	0	0	0	0	0	0	0
Up-Front Charge	0	0	0	0	0	0	0	0	0	0
Total interest, adjusted	0	0	0	0	0	0	0	0	0	0
Of which interest capitalized is	0	0	0	0	0	0	0	0	0	0
DEBT SERVICE SUMMARY										
AMORTIZATION:										
Facility Construction Loan	0	51	126	126	126	126	126	126	126	126
Loan No. 2	0	0	0	0	0	0	0	0	0	0
Loan No. 3	0	0	0	0	0	0	0	0	0	0
Loan No. 4 (Bond Issue)	0	0	0	0	0	0	0	0	0	0
Loan No. 5	0	0	0	0	0	0	0	0	0	0
Existing Loans										
Existing Bonds	0	0	0	0					0	0
TOTAL AMORTIZATION		51	126	126	126	126	126	126	126	126
INTEREST CAPITALIZED										
Facility Construction Loan	0	0	0	0	0	0	0	0	0	0
Loan No. 2	0	0	0	0	0	0	0	0	0	0
Loan No. 3	0	0	0	0	0	0	0	0	0	0
Loan No. 4 (Bond Issue)	0	0	0	0	0	0	0	0	0	0
Loan No. 5	0	0	0	0	0	0	0	0	0	0
Existing Loans	0	0	0	0	0	0	0	0	0	0
Existing Bonds	0	0	0	0	0	0	0	0	0	0
TOTAL INTEREST CAPITALIZED								0	0	0
OPERATIONAL INTEREST:										
Facility Construction Loan	67	129	119	106	92	78	64	50	36	22
Loan No. 2	0	0	0	0						
Loan No. 3	0	0	0	0						
Loan No. 4 (Bond Issue)										
Loan No. 5	0	0	0	0	0	0	0	0	0	0
Existing Loans										
Existing Bonds										
TOTAL OPERATIONAL INTEREST	67	129	119	106	92	78	64	50	36	22
Long-Term Debt (Gross)	1,200	1,149	1,023	897	771	644	518	392	285	139

FINPRO - FINANCIAL PROJECTION PROGRAM
SMALL & MEDIUM SIZED SECONDARY LEAD SMELTERS

*Gairo Air Improvement Project
Small Medium Size Lead Smelter Relocation Plan
Financial Analysis*

TABLE 4	PRODUCT SALES AND REVENUE ANALYSIS									
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
PROGRAM TOTALS										
Total product sales, metric tons		713								
% Growth rate of sales		(First Year)	50.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total product sales, metric tons		713	1,070	1,070	1,070	1,070	1,070	1,070	1,070	1,070
INGOTS - HARD										
		Demand Totalizer:	1		Revenue Totalizer:	1				
Tons Sold	0									
Current price (LE) & %real increase	2,700	0%	0%	0%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
Price at Constant prices - LE	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700
Tariff in Current Prices - LE	2,754	2,809	2,865	2,923	2,981	3,041	3,101	3,163	3,227	3,291
Revenues from Hard Ingot sales - LE 000	-	-	-	-	-	-	-	-	-	-
INGOTS - SOFT										
		Demand Totalizer:	1		Revenue Totalizer:	1				
Tons Sold	0	713	1,070	1,070	1,070	1,070	1,070	1,070	1,070	1,070
Current price (LE) & %real increase	2,300	0%	0%	0%	0%	0%	0%	0%	0%	0%
Tariff on Current-Constant prices - LE	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300
Tariff in Current Prices - LE	2,346	2,393	2,441	2,490	2,539	2,590	2,642	2,695	2,749	2,804
Revenues from Soft Ingot sales - LE 000	-	1,707	2,612	2,654	2,717	2,771	2,827	2,883	2,941	3,000
PIPE										
		Demand Totalizer:	1		Revenue Totalizer:	1				
Tons Sold	0	0	0	0	0	0	0	0	0	0
Current price (LE) & %real increase	2,800	0.00%	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Tariff on Current-Constant prices - LE	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800
Tariff in Current Prices - LE	2,856	2,913	2,971	3,031	3,091	3,153	3,216	3,281	3,346	3,413
Revenues From Pipe Sales - LE 000	0	0	0	0	0	0	0	0	0	0
OTHER PRODUCTS										
		Demand Totalizer:	1		Revenue Totalizer:	1				
Oxides	0	0	-	-	-	-	-	-	-	-
Plates	0	0	-	-	-	-	-	-	-	-
Fittings	0	0	-	-	-	-	-	-	-	-
Total tons sold	0	-	-	-	-	-	-	-	-	-
Aggregate price (LE) & %real increase	4,770	0%	0%	0%	0%	0%	0%	0%	0%	0%
Tariff on Current-Constant prices - LE	4,770	4,770	4,770	4,770	4,770	4,770	4,770	4,770	4,770	4,770
Tariff in Current Prices - LE	4,866	4,963	5,062	5,163	5,267	5,372	5,479	5,589	5,701	5,815
Rev. From Other Product Sales - LE 000	0	0	0	0	0	0	0	0	0	0

FINPRO - FINANCIAL PROJECTION PROGRAM
SMALL & MEDIUM SIZED SECONDARY LEAD SMELTERS

Cairo Air Improvement Project
Small Medium Sized Smelter Relocation Plan
Financial Analysis

TABLE 6

DEMAND AND REVENUES SUMMARY

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
TOTAL PRODUCT SALES - MT 000	-	713	1,070.0	1,070.0	1,070.0	1,070.1	1,070.0	1,070.0	1,070.0	1,070.0
Revenue from soft ingot sales - LE 0	-	-	-	-	-	-	-	-	-	-
Revenue from soft ingot sales - LE 000	-	1,707	2,612	2,664	2,717	2,771	2,827	2,883	2,941	3,000
Revenue from pipe sales - LE 000	-	-	-	-	-	-	-	-	-	-
Revenue from other product sales -	-	-	-	-	-	-	-	-	-	-
TOTAL PRODUCT SALES - LE 000	-	1,707	2,612	2,664	2,717	2,771	2,827	2,883	2,941	3,000
Revenue from sales of recycled wastes	-	127	195	199	203	207	211	215	220	224
1-TOTAL REVENUES (as above):	-	1,834	2,807	2,863	2,920	2,978	3,038	3,099	3,161	3,224
REVENUES ANALYSIS										
Target Rate of return (ROR)		20%	20%	20%	20%	20%	20%	20%	20%	20%
Target % Contrib. to investment		25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
Year to start applying these financial targets		2000								
2-Revenues for Target ROR		2,565	3,344	3,429	3,388	3,408	3,498	3,453	3,479	3,580
3-Revenues for target %Contrib.		1,627	2,489	2,481	2,457	2,512	2,638	2,609	2,671	2,809
Target to be used (1, 2 or 3):	1									
Revenues for Target	0	1,834	2,807	2,863	2,920	2,978	3,038	3,099	3,161	3,224
Factor to incr. tariff revenues	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
OTHER REVENUES OR CONTRIBUTIONS:										
Other Income (Non-operational)	0	0	0	0	0	0	0	0	0	0
Investors' Initial Equity	1,708	-	0	0	0	0	0	0	0	0
USAID Grant (loan interest, 1st 16 months)	87	65	0	0	0	0	0	0	0	0
(Reserved)	-	-	-	-	-	-	-	-	-	-

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**SMALL & MEDIUM SIZED SECONDARY LEAD SMELTERS
INCOME STATEMENT FORECASTS**

Thousand LE
Fy ends 12/31

*Cairo Air Improvement Project
Small Medium Sized Smelter Relocation Plan
Financial Analysis*

TABLE 6	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Product Sales - Metric Tons										
Hard ingots	-	0	0	0	0	0	0	0	0	0
Soft ingots	-	713	1,070	1,070	1,070	1,070	1,070	1,070	1,070	1,070
Pipe	-	0	0	0	0	0	0	0	0	0
Other products	-	0	0	0	0	0	0	0	0	0
Total Product Sales - metric tons	-	713	1,070	1,070	1,070	1,070	1,070	1,070	1,070	1,070
Product Sales - LE 000										
Hard ingot sales	-	-	-	-	-	-	-	-	-	-
Soft ingot sales	-	1,707	2,612	2,664	2,717	2,771	2,827	2,883	2,941	3,000
Pipe sales	-	-	-	-	-	-	-	-	-	-
Other product sales	-	-	-	-	-	-	-	-	-	-
Total Product Sales - LE 000	-	1,707	2,612	2,664	2,717	2,771	2,827	2,883	2,941	3,000
Revenue from sales of recycled wastes	-	127	195	199	203	207	211	215	220	224
Total Revenue - LE 000	-	1,834	2,807	2,863	2,920	2,978	3,038	3,099	3,161	3,224
Personnel	-	50	78	80	82	85	87	90	92	95
Scrap Battery Feedstock	-	1,101	1,703	1,756	1,808	1,859	1,911	1,965	2,021	2,079
Process Additives (Flux, etc.)	-	61	100	103	106	109	112	115	118	122
Diesel Fuel	-	58	89	92	95	98	100	103	106	109
Electricity	-	36	56	57	59	61	62	64	66	68
Slag & Other Waste Disposal	-	8	12	12	13	13	13	14	14	14
Maintenance	-	28	44	106	47	48	117	51	52	128
Admin., Overhead & Utilities	-	15	23	24	24	25	28	26	27	28
TOTAL OPERATING EXPENSES	-	1,360	2,104	2,232	2,234	2,297	2,429	2,428	2,496	2,641
INCOME BEFORE DEPRECIATION	-	474	703	631	686	682	609	671	664	583
Depreciation	-	143	215	215	215	215	215	215	215	215
Non-cash expenditures	-	-	-	-	-	-	-	-	-	-
OPERATING INCOME	-	331	488	416	471	467	394	456	449	368
Operational Interest	67	129	119	106	92	78	64	50	36	22
USAID Credit for Interest (1st 18 months)	67	65	-	-	-	-	-	-	-	-
NET INCOME BEFORE TAXES	-	266	368	310	380	389	330	406	413	346
Income taxes	-	107	147	124	152	156	132	162	165	138
Employee Bonus (13th month)	-	-	4	6	7	7	7	7	7	8
NET INCOME AFTER TAXES	-	160	217	180	221	228	191	236	240	200
RATIOS AND COMPARATORS:										
Avg Expenses/Metric Ton Sold - LE	N/A	1,906	1,966	2,086	2,087	2,146	2,270	2,269	2,333	2,468
Working Ratio	N/A	74%	75%	78%	76%	77%	80%	78%	79%	82%
Operating Ratio	N/A	82%	83%	85%	84%	84%	87%	85%	86%	89%
Net Income on Revenues	N/A	15%	13%	11%	13%	13%	11%	13%	13%	11%
Real Increases in Product Prices	N/A	0%	0%	0%	0%	0%	0%	0%	0%	0%
Increase in Operating Revenues	N/A	N/A	53%	2%	2%	2%	2%	2%	2%	2%
Increase in No. of Tons Sold	N/A	N/A	50%	0%	0%	0%	0%	0%	0%	0%
Average Asset's Rate Base - LE - 000	N/A	5,307	5,128	4,912	4,697	4,482	4,267	4,052	3,837	3,622
Rate of Return on Investor's Equity	N/A	15.5%	21.3%	17.8%	21.8%	22.4%	18.9%	23.3%	23.7%	19.8%

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SMALL & MEDIUM SIZED SECONDARY LEAD SMELTERS
 SOURCES AND APPLICATIONS OF FUNDS PROJECTIONS

Thousand LE
 2 y Ends 12/31

TABLE 7	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
SOURCES OF FUNDS:										
Income before depreciation	-	474	703	631	585	682	609	671	664	583
USAID Grant	67	65	-	-	-	-	-	-	-	-
Investor's Initial Equity	1,708	-	-	-	-	-	-	-	-	-
GROSS INTERNAL CASH GENERATION	1,775	539	703	631	585	682	609	671	664	583
Other	-	-	-	-	-	-	-	-	-	-
Other Contributions	-	-	-	-	-	-	-	-	-	-
(Reserved)	-	-	-	-	-	-	-	-	-	-
BORROWING										
Facility Construction Loan	1,200	-	-	-	-	-	-	-	-	-
Loan No. 2	-	-	-	-	-	-	-	-	-	-
Loan No. 3	-	-	-	-	-	-	-	-	-	-
Loan No. 4	-	-	-	-	-	-	-	-	-	-
Loan No. 5	-	-	-	-	-	-	-	-	-	-
TOTAL BORROWING	1,200	-	-	-	-	-	-	-	-	-
TOTAL SOURCES OF FUNDS	2,975	539	703	631	585	682	609	671	664	583
APPLICATIONS OF FUNDS:										
New Smelter Facility	5,379	-	-	-	-	-	-	-	-	-
Interest Capitalized, Project	-	-	-	-	-	-	-	-	-	-
Initial Inventory of Feed Materials	258	-	-	-	-	-	-	-	-	-
Interest Capitalized, Other Projects	-	-	-	-	-	-	-	-	-	-
(Reserved)	-	-	-	-	-	-	-	-	-	-
Invest to become defer.expenses	-	-	-	-	-	-	-	-	-	-
TOTAL CAPITAL EXPENDITURES	5,636	-	-	-	-	-	-	-	-	-
Amortization	-	51	126	126	126	126	126	126	126	126
Operational Interest	67	129	115	108	92	78	64	50	38	22
TOTAL DEBT SERVICE	67	180	241	234	218	204	190	175	162	148
Income Taxes	-	107	147	124	152	156	132	162	166	138
Bonuses to Directors & Employees	-	-	4	6	7	7	7	7	7	8
WORKING CAPITAL NEEDS	-	152	140	16	5	11	16	5	12	20
OTHER ASSETS/LIABIL. CHANGES	-	-	-	-	-	-	-	-	-	-
TOTAL APPLICATIONS OF FUNDS	5,703	439	537	300	302	378	347	351	347	314
CASH INCREASE (+) OR DECREASE	(2,728)	101	166	251	283	304	261	320	317	269
Debt Service Ratio	N/A	3.0	2.9	2.7	3.1	3.3	3.2	3.8	4.1	3.9
% Contribution to Investment	77.5%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
% Capital expend. of Net Assets	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

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**SMALL & MEDIUM SIZED SECONDARY LEAD SMELTERS
BALANCE STATEMENT PROJECTIONS**

Thousand L.F.
Fy ends 12/31

TABLE B	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Fixed Assets in Operation	-	5,379	5,379	5,379	5,379	5,379	5,379	5,379	5,379	5,379
Accumulated Depreciation	-	143	359	574	760	1,004	1,219	1,434	1,649	1,865
NET FIXED ASSETS	-	5,235	5,020	4,805	4,619	4,375	4,159	3,944	3,729	3,514
WORK IN PROGRESS	5,379	-	-	-	-	-	-	-	-	-
Cash	250	351	516	767	1,072	1,376	1,637	1,957	2,274	2,543
Accounts Receivable	-	50	77	70	89	82	64	65	87	89
Inventories	102	204	315	325	335	341	354	364	374	385
Other Current Assets	-	7	11	19	12	12	19	13	13	21
Advances to employees & suppliers	3	7	11	11	11	11	12	12	12	13
TOTAL CURRENT ASSETS	355	612	930	1,203	1,510	1,826	2,106	2,431	2,761	3,051
DEFERRED EXPENSES	0	0	0	0	0	0	0	0	0	0
OTHER ASSETS	-	0	0	0	0	0	0	0	0	-
TOTAL ASSETS	5,734	5,854	5,950	6,005	6,109	6,200	6,266	6,376	6,490	6,565
Accounts Payable	-	11	17	18	18	18	19	19	20	21
Other Current Liabilities	-	0	0	0	0	0	0	0	0	0
Current Matur. Long-Term Debt	0	125	126	126	126	126	126	126	126	126
Advances from customers	-	0	0	0	0	0	0	0	0	0
TOTAL CURRENT LIABILITIES	51	137	143	144	144	144	145	145	146	147
Other Liabilities	0	0	0	0	0	0	0	0	0	0
Long-Term Debt (net)	1,149	1,023	897	771	644	518	392	265	139	(17)
TOTAL LIABILITIES	1200	1,160	1,040	914	788	662	537	411	285	130
Assets Revaluation Surplus	0	-	0	-	-	-	-	-	-	-
Retained Earnings	0	-	217	397	618	844	1,035	1,271	1,511	1,711
Capital	4,534	4,694	4,694	4,694	4,694	4,694	4,694	4,694	4,694	4,694
TOTAL EQUITY	4,534	4,694	4,911	5,090	5,311	5,538	5,729	5,965	6,205	6,435
TOTAL EQUITY AND LIABILITIES	5,734	5,854	5,950	6,005	6,109	6,200	6,266	6,376	6,490	6,565
Current Ratio	N/A	4.5	6.5	8.3	10.5	12.6	14.5	16.7	18.9	17.2
Working Capital, Excluding Cash	103	258	397	415	429	432	450	455	467	487
Debt on Debt plus Equity - %	N/A	20%	17%	15%	13%	10%	8%	6%	4%	2%
# Days Accounts Receivable	N/A	10	10	10	10	10	10	10	10	10
% Debt/(Net Fixed Assets + WIP)	N/A	22%	20%	19%	17%	15%	12%	10%	7%	4%

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**SMALL & MEDIUM SIZED SECONDARY LEAD SMELTERS
FINANCING**

Thousand LE
Fy ends 12/31

TABLE 9	TOTAL	% OF TOT.	1999
Income Before Depreciation	-	0.0%	-
Other Income	-	0.0%	-
Owner's Equity	1,708	30.3%	1,708
GROSS INTERNAL CASH GENERATION	1,708	30.3%	1,708
MINUS:			
Amortization	-	0.0%	-
Operational Interest	67	1.2%	67
TOTAL DEBT SERVICE	67	1.2%	67
TAXES & BONUSES	-	0.0%	-
WORKING CAPITAL NEEDS (+)	-	0.0%	-
OTHER ASSETS (+) OR LIAB.NEEDS	-	0.0%	-
CASH INCREASE (+) OR DECREASE	(2,728)	-48.4%	(2,728)
NET INTERNAL CASH GENERATION	4,369	77.5%	4,369
CAPITAL EXPENDITURES			
New smelter facility and equipment	5,379	95.4%	5,379
Interest Capitalized, Project	-	0.0%	-
Other Capital Projects	258	4.6%	258
Interest Capitalized, Other Projects	-	0.0%	-
(Reserved)	-	0.0%	-
TOTAL CAPITAL EXPENDITURES	5,636	100.0%	5,636
NET TO BE FINANCED:	1,267	22.5%	1,267
FINANCED BY:			
Smelter Facility Construction Loan	1,200	21.3%	1,200
Loan No. 2	-	0.0%	-
Loan No. 3	-	0.0%	-
Loan No. 4	-	0.0%	-
TOTAL BORROWING	1,200	21.3%	1,200
USAID Grant	67	1.2%	67
Other Contributions	-	0.0%	-
(Reserved)	-	0.0%	-
TOTAL FINANCED	1,267	22.5%	1,267

SMALL & MEDIUM SIZED SECONDARY LEAD SMELTERS
MONITORING INDICATORS

Units as indicated
Fiscal Year Ends 12/31

Case Air Improvement Project
Small Medium Size Lead Smelter Rehabilitation Phase
Financial Analysis

TABLE 10	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
PRODUCT SALES - Metric Tons										
Hard ingots	-	-	-	-	-	-	-	-	-	-
Soft ingots	-	713	1,070	1,070	1,070	1,070	1,070	1,070	1,070	1,070
Pipe	-	-	-	-	-	-	-	-	-	-
Other products	-	-	-	-	-	-	-	-	-	-
Total Product Sales	-	713	1,070	1,070	1,070	1,070	1,070	1,070	1,070	1,070
MANAGEMENT:										
# Days Accounts Receivable	#	10	10	10	10	10	10	10	10	10
Number of Senior Managers	-	2	2	2	2	2	2	2	2	2
Number of Admin. & Operating Personnel	-	16	16	16	16	15	16	15	16	16
Avg. Salary/Employee (Excl. Sr. Mgrs.), LE/Yr.	-	3,205	3,205	3,408	3,510	3,609	3,710	3,815	3,923	4,033
PROJECT DEVELOPMENT										
Capital Cost of New Smelter, LE - 000	-	5,379	5,379	5,379	5,379	5,379	5,379	5,379	5,379	5,379
Capital Cost of New Smelter, US\$ - 000	-	1,586	1,586	1,586	1,586	1,586	1,586	1,586	1,586	1,586
Cumul. Loan for New Smelter, LE - 000	-	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Disbursement Profile	-	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
FINANCIAL										
Cost of Scrap Battery Feed - LE/mt of product	-	1,543	1,591	1,641	1,690	1,737	1,788	1,837	1,888	1,942
Other Operating Expenses - LE/mt of product	-	383	375	445	398	409	484	433	445	528
Prices of Hard ingots - LE/mt	-	2,809	2,865	2,923	2,981	3,041	3,101	3,163	3,227	3,291
Prices of Soft ingots - LE/mt	-	2,393	2,441	2,490	2,539	2,590	2,642	2,695	2,748	2,804
Prices of Pipes - LE/mt	-	2,913	2,971	3,031	3,091	3,153	3,216	3,281	3,348	3,413
Prices of other products - LE/mt	-	4,968	5,062	5,163	5,267	5,372	5,479	5,589	5,701	5,815
Working Ratio	-	74%	76%	78%	78%	77%	80%	78%	78%	82%
Rate of Return on Investor's E	-	15.8%	21.3%	17.8%	21.8%	22.4%	18.8%	23.3%	23.7%	18.5%
Debt Service ratio	-	3.0	2.9	2.7	3.1	3.3	3.2	3.6	4.1	3.9
Debt on Debt plus Equity	-	20%	17%	15%	13%	10%	8%	6%	4%	2%
1998 CONSTANT PRICE ANALYSIS										
Scrap Battery Feed - LE/mt of dry batteries	-	1,020	1,020	1,020	1,020	1,020	1,020	1,020	1,020	1,020
Hard ingots	-	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700
Soft ingots	-	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300
Pipes	-	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800
Other products	-	4,770	4,770	4,770	4,770	4,770	4,770	4,770	4,770	4,770
Avg. Salary/Employee (Excl. Sr. Mgrs.), LE/Yr.	-	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
CRITICAL FINANCIAL INDICATORS										
VARIABLE OR INDICATOR	MINIMUM	MAXIMUM	AVERAGE							
Cash	361	2,543	1,274	VARIABLE OR INDICATOR	MINIMUM	MAXIMUM	AVERAGE			
Scrap Battery Feed - LE/mt dry, 1998 prices	1,020	1,020	1,020	Debt Service Ratio	2.7	4.1	3.3			
Working ratio	74%	82%	78%	Contribution to investment	N/A	77.5%	N/A			
Rate of Return on Investor's Equity	15.6%	29.7%	20.5%	Days Accounts Receivable	10	10	10			
				Debt/(debt + equity)	2%	20%	11%			

RD-2-A-16

**SMALL & MEDIUM SIZED SECONDARY LEAD SMELTERS
ESTIMATED FACILITY COSTS**

ملايو 99

Fiscal Year Ending December 31

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Fiscal Year Ending December 31										
ASSUMPTIONS										
All base costs at 12/97										
Domestic Inflation	4.50%	4.50%	4.00%	4.00%	4.00%	3.50%	3.50%	3.50%	3.50%	3.50%
Domestic Escal. Factor	1.02	1.07	1.11	1.15	1.20	1.25	1.29	1.34	1.39	1.43
Foreign Inflation	2.00%	1.80%	1.80%	1.80%	1.80%	1.80%	1.80%	1.80%	1.80%	1.80%
Foreign Escal. Factor	1.01	1.03	1.05	1.07	1.09	1.11	1.13	1.15	1.17	1.19
Contingencies - Civil Works	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
Conting. - Mech. & Elec.	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
Duties - Mining and Refining Equipment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Duties - Mobile Equipment	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Sales Tax	0	0	0	0	0	0	0	0	0	0
LE/US\$ Exch. Rate	5.36	3.38	3.38	3.38	3.38	2.38	3.38	3.38	3.38	3.38
Note: Customs duties are estimated separately for each component of the system										
	LE 000									
LAND										
Base Cost - Land		150	0	0	0	0	0	0	0	0
Physical Contingencies	0	38	0	0	0	0	0	0	0	0
Price Conting. (Domestic)	0	13	0	0	0	0	0	0	0	0
Taxes & Duties	0	0	0	0	0	0	0	0	0	0
Total Land	0	200	0	0	0	0	0	0	0	0
SMELTER BUILDING										
Civil/Structural Works (Base)	0	1,018		0	0	0	0	0	0	0
Physical Contingencies	0	255	0	0	0	0	0	0	0	0
Price Conting. (Domestic)	0	87	0	0	0	0	0	0	0	0
Taxes & Duties	0	0	0	0	0	0	0	0	0	0
Subtotal, Civil/Structural Works	0	1,360	0	0	0	0	0	0	0	0
Mechanics & Electrical (Base)	0	182		0	0	0	0	0	0	0
Physical Contingencies	0	46	0	0	0	0	0	0	0	0
Price Conting. (Local)	0	10	0	0	0	0	0	0	0	0
Taxes and Duties	0	0	0	0	0	0	0	0	0	0
Subtotal Mech. & Elec.	0	243	0	0	0	0	0	0	0	0
Total Smelter Building	0	1,603	0	0	0	0	0	0	0	0
FURNACES										
Furnaces & Accessories (Base Cost)	0	220	0	0	0	0	0	0	0	0
Physical Contingencies	0	55	0	0	0	0	0	0	0	0
Price Conting. (Foreign)	0	2	0	0	0	0	0	0	0	0
Taxes & Duties	0	0	0	0	0	0	0	0	0	0
Sub-total Furnaces & Accessories	0	283	0	0	0	0	0	0	0	0
Mechanics & Electrical (Base)	0	0	0	0	0	0	0	0	0	0
Physical Contingencies	0	0	0	0	0	0	0	0	0	0
Price Contingency (Foreign)	0	0	0	0	0	0	0	0	0	0
Taxes & Duties	0	0	0	0	0	0	0	0	0	0
Sub-total Mech. & Elec.	0	0	0	0	0	0	0	0	0	0
Total Furnaces	0	283	0	0	0	0	0	0	0	0
98-0000-7										

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SMALL & MEDIUM SIZED SECONDARY LEAD SMELTERS
 ESTIMATED FACILITY COSTS

99-2-25-17

Fiscal Year Ending December 31

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
CASTING SYSTEMS										
Refining, Casting & Handling Systems, Base	0	18		0	0	0	0	0	0	0
Physical Contingencies	0	5	0	0	0	0	0	0	0	0
Price Contingencies (Foreign)	0	*	0	0	0	0	0	0	0	0
Taxes & Duties	0	0	0	0	0	0	0	0	0	0
Subtotal, Refining, Casting and Handling	0	23	0	0	0	0	0	0	0	0
Mechanical & Electrical	0	0		0	0	0	0	0	0	0
Physical Contingencies	0	0	0	0	0	0	0	0	0	0
Price Contingencies (Foreign)	0	0	0	0	0	0	0	0	0	0
Taxes & Duties	0	0	0	0	0	0	0	0	0	0
Subtotal, Mechanical & Elec.	0	0	0	0	0	0	0	0	0	0
Total	0	23	0	0	0	0	0	0	0	0
ACCESSORY BUILDINGS										
Buildings, Complete	0	0		0	0	0	0	0	0	0
Physical Contingencies	0	0	0	0	0	0	0	0	0	0
Price Conting. (Local)	0	0	0	0	0	0	0	0	0	0
Taxes & Duties	0	0	0	0	0	0	0	0	0	0
Total Accessory Buildings	0	0	0	0	0	0	0	0	0	0
AIR POLLUTION CONTROL EQUIPMENT										
Equipment, ductwork, foundations - complete	0	340		0	0	0	0	0	0	0
Physical Contingencies	0	55	0	0	0	0	0	0	0	0
Price Contingencies (Foreign)	0	12	0	0	0	0	0	0	0	0
Taxes & Duties	0	0	0	0	0	0	0	0	0	0
Total Air Pollution Equipment	0	407	0	0	0	0	0	0	0	0
MOBILE EQUIPMENT										
Front End Loaders & Fork Lifts	0	30	0	0	0	0	0	0	0	0
Physical Contingencies	0	8	0	0	0	0	0	0	0	0
Price Contingency (Local Basis)	0	0	0	0	0	0	0	0	0	0
Taxes and Duties	0	0	0	0	0	0	0	0	0	0
Total Mobile Equipment	0	40	0	0	0	0	0	0	0	0
CONSTRUCTION & INSTALLATION										
Item		55	0	0	0	0	0	0	0	0
Physical Contingencies	0	14	0	0	0	0	0	0	0	0
Price Contingencies (Foreign)	0	2	0	0	0	0	0	0	0	0
Taxes and Duties	0	0	0	0	0	0	0	0	0	0
Total	0	71	0	0	0	0	0	0	0	0
TOTAL PROJECT COSTS	0	2,658	0	0	0	0	0	0	0	0

99-2-25-17

SMALL & MEDIUM SIZED SECONDARY LEAD SMELTERS
ESTIMATED FACILITY COSTS

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Fiscal Year Ending December 31

	1995	1999	2000	2001	2002	2003	2004	2005	2006	2007
INVESTMENT SUMMARY										
						US \$ 000				
Land	0	59	0	0	0	0	0	0	0	0
Smelter Building	0	474	0	0	0	0	0	0	0	0
Furnaces	0	84	0	0	0	0	0	0	0	0
Refining and Casting Equipment	0	7	0	0	0	0	0	0	0	0
Accessory Buildings	0	0	0	0	0	0	0	0	0	0
Air Pollution Control Equipment & Systems	0	129	0	0	0	0	0	0	0	0
Mobile Equipment	0	12	0	0	0	0	0	0	0	0
Construction & Installation	0	21	0	0	0	0	0	0	0	0
Total Project	0	785	0	0	0	0	0	0	0	0

Program Component	LE-000	US \$-M
Total Cost of Smelter Relocation	2,658	0.75

COST SUMMARY

BASE COSTS at 1/1/98 Prices	Tot.Cost	LE - 000	For.Exch.
Land	150		0
Smelter Building	1,200		300
Furnaces	220		167
Refining and Casting Equipment	18		15
Accessory Buildings	0		0
Mobile Equipment	30		30
Air Pollution Control Equipment	340		269
Construction & Installation	55		0
Total Base Costs	2,013		824
PHYSICAL CONTINGENCIES	503		206
PRICE CONTINGENCIES	141		55
TOTAL EST. PHYSICAL COSTS	2,658		1,088
TAXES & DUTIES	0		0
INTEREST DURING CONST. - LE 000	0		0
TOT. PROJ. COSTS-LE 000	2,658		1,088
(Expressed in Thousand US \$)	785.4		321.5 41%

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WORKSHEET ON BASE COSTS			
SMALL & MEDIUM SIZED SECONDARY LEAD SMELTERS			
ITEM	Estimated Cost - US \$	Account No. Ref. From S. & W. Conceptual Engineering Est.	
SMELTER BUILDING			
Civil Works	241,785	400, 2410, 2600	
	-	Found. & Structural Steel, LS (now in 2410)	
	59,102	Site Preparation	
Total Civil Works	300,887		
Mechanical & Electrical	2,069	500	
	51,714	1600, 1700, 1900, 2510, 2511, 2513, 2521, 2320	
Total Mechanical & Electrical	53,783		
Total Smelter Building	354,669		
FURNACES			
Furnaces & Accessories	65,012	800, 900	
Foundations & structural	-		
Total Furnaces Accessories & Installation	65,012		
Installation & Mechanical & Electrical			
Total Install. & M & E	-		
Total Furnaces	65,012		
CASTING SYSTEMS			
Refining, Casting & Handling Systems	5,319	2340	
Foundations & structural	-		
Total Equipment	5,319		
Install. & Mechanical & Electrical			
Total Install. & M & E	-		
Total	5,319		
ACCESSORY BUILDINGS			
	-		
Total Accessory Buildings	-		
AIR POLLUTION CONTROL EQUIPMENT			
Equipment:	88,652	1500	
Ductwork & hoods, foundations, etc.	8,865	1400	
System component foundations	2,955	1800	
Total Pollution Control	100,473		
MOBILE EQUIPMENT			
Fork Lift	8,865	2200	
Total Mobile Equipment	8,865		
SUBTOTAL	534,338		
20% Allowance for contingencies	106,868		
TOTAL WITHOUT LAND PURCHASE	641,206		
LE Equiv.	2,169,840		
LAND			
New Site - 1500 M ²	44,326	est. LE 100/M ²	
TOTAL (including land purchase) US\$	685,532		
LE Equiv.	2,319,840		
99-حبرابر-15:			

New Small and Medium Smelter - Operating Cost Worksheet				
Staffing	Requirement	Sal./Mo.	Benefits	Sal./Yr.
		LE	%	LE
General Manager ¹	0	5,000	25	
Manager	1	1,500	25	27,500
Senior Materials Engineer	0	600	25	
Engineers	0	300	25	
Finance Operators	0	350	25	
Foremen	3	300	25	13,500
Accountant	1	450	25	6,750
Materials & Supply	0	200	25	
Operating Labor	9	150	25	20,250
Maintenance Labor	2	150	25	4,500
General Labor	2	100	25	3,000
Office/Administration	0	200	25	
Drivers	0	200	25	
Totals	18		25	70,500
Note: 1. Salaries for General Manager and Manager are illustrative only				
Process Inputs for Annual Production Capacity of 1,000 mt				
Item	Quantity Units/yr	Unit Cost LE/Unit	Total Cost LE/yr	
Feed Stock ¹ - mt				
Whole dry lead acid batteries	1,515	1,020	1,545,300	
Lead bearing scrap	0	2,100		
(Equivalent to 16,549 mt of scrap battery feed only)				
Blas Furnace - mt				
Foundry coke	0	750		
Steel shavings	0	250		
Iron/steel chunks	0	2,500		
Limestone	0	6.25		
Sand	0	6.25		
Rotary Furnaces - mt				
Soda ash	3	1,500	45,000	
Coal fines	57	100	5,700	
Steel shavings	153	250	38,250	
Refining - mt				
Arsenic	0	18,000		
Antimony	0	25,000		
Tin	0	25,000		
Selenium	0	50,000		
Miscellaneous - LS		LS		
Diesel Fuel - CuM	203	400	81,200	
Electricity				
Consumption - KWH	290,000	0.18	50,400	
Demand - KVA				
Water - CuM	3,855	0.70	2,699	
Maintenance - LS			39,870	
Admin., Overhead & Utilities - LS			13,099	
			1,828,018	
Process Outputs for Annual Production Capacity of 1,000 mt				
Item	Quantity Units/yr	Unit Price or (Cost) LE/Unit	Cost LE/yr	Revenue LE/yr
Waste - mt				
Slag	134	50	6,700	
Econite/hard rubber	35	1,750		61,250
Polypropylene	70	1,750		122,500
Separators	0	50		
Other waste	80	50	4,000	
Products - mt				
Pipe	0	2,800		
Oxides	0	3,600		
Plates	0	4,850		
Ingot - soft (crude)	1,070	2,300		2,461,000
Ingot - hard	0	2,700		
Fittings	0	5,500		
	1,070		20,700	2,644,750
Subtotal, Process Expenses			1,909,218	
Income from Operations			735,532	